

486 UMC VESA BOARD

V.01 JAN., 1994

TRADEMARKS

PC, XT, AT, and PS/2 are trademarks of IBM Corporation.

Microsoft, MS-DOS, OS/2, XENIX, and Windows are trademarks of Microsoft Corporation.

UNIX is a trademark of Bell Laboratories.

AutoCAD is a registered trademark of Autodesk Inc.

Wordstar is a registered trademark of MicroPro International Corporation.

WordPerfect is a trademark of WordPerfect Corporation.

Lotus 1-2-3 is a registered trademark of Lotus Development Corporation.

dBASEIII Plus is a registered trademark of Ashton-Tate.

Weitek is a trademark of Weitek Co.

Intel is a trademark of Intel Corp.

Am486 is a trademark of Advanced Micro Devices, Inc.

OrCAD is a trademark of An Intelligent system Co.,

Novell is a trademark of Novell Corporation.

VESA is a Video electronics standards association.



PREFACE

We, the manufacturers, would like to congratulate you on, what we think was a very wise decision to purchase this mainboard.

No matter what walk of life, this board will perform beyond the call of duty giving you not only excellent value for your money, but performance second to none.

We hope that this manual will provide all the information that you will need to operate your PC/AT. However, should you require any further information, please contact your dealer who will be pleased to assist you.



TABLE OF CONTENTS

CHAPTER 1 Introduction

1-1 Specifications	1
1-2 Software Compatibility	3
1-3 Performance	3
1-4 Mainboard Layout	3
1-5 Mainboard Connectors and Jumper Settings	5
1-6 CPU Type and CPU Clock Reference Table.....	7
1-7 Cache RAM Size Configuration	8

CHAPTER 2 Configuration

2-1 Microprocessor	12
2-2 The UMC Chipset	14
2-3 Shadow RAM & Memory Remapping	14
2-4 Memory	16
2-5 Memory & Bank Configuration	17
2-6 Keyboard Controller	20
2-7 VESA Local Bus Pin Definition	21

CHAPTER 3 Installation

3-1 Static Electricity Precautions	23
3-2 Peripherals Required	24
3-3 Building Up a System	25

CHAPTER 4 AWARD BIOS Setup

4-1 Standard CMOS Setup	28
4-2 BIOS Features Setup	29
4-3 Chipset Features Setup	30
4-4 Power Management Setup	31
4-5 Load Setup Defaults	33
4-6 Change Password	34
4-7 Auto Detect Hard Disk	35
4-8 Save and Exit Setup	36
4-9 Exit Without Saving	36

CHAPTER 5 AMI BIOS Setup

5-1 Standard CMOS Setup	38
5-2 Advanced CMOS Setup	39
5-3 Advanced Chipset Setup	40
5-4 Auto Configuration with BIOS Defaults	41
5-5 Auto Configuration with Power-On Defaults...	42
5-6 Change Password	43
5-7 Auto Detect Hard Disk	44
5-8 Write to CMOS and Exit	45
5-9 Do not Write to CMOS and Exit	45

1

INTRODUCTION

This board is a high-performance AT-compatible system board that provides incredible speed in processing while maintaining full compatibility with the IBM* PC/AT*. The system board is designed to be mounted in a standard PC/XT*, Baby AT, or PC/AT-type enclosure and uses industry-standard power supply inputs, connectors, expansion board sockets, and so forth. In other words, you can design a new system, or upgrade your existing system with no modifications to existing, or available, components. The following sections will provide quick and precise information for the end user to understand and properly use the mainboards.

1-1 SPECIFICATIONS

□ CPU:

- Intel 80486SX-25/33, 80486DX-33/50, 80486DX2-50/66, ODP486(OVERDRIVE)-25/33, Am486™DX-40, Am486™DX2-66
- Cyrix Cx486-40
- Optional 169/239 pin PGA CPU Socket



The Am-486™ microprocessor family is designed for maximum performance and software compatibility.

❑ **MEMORY**

- 30pin SIMM Socketx8
(256KB, 1MB, 4MB, 16MB 9bit SIMM Modules acceptable)
- Optional 72pin SIMM Socketx2
(1MB, 2MB, 4MB, 8MB, 16MB 36-bit SIMM Modules acceptable)
- Maximum 64MB on board

❑ **CACHE MEMORY:**

64K/128K/256K (8Kx8, 32Kx8, DIP)

❑ **I/O SLOTS:**

ISA bus 16bit x 6

VESA Local bus (Master mode) x 3

❑ **SHADOW RAM:**

System BIOS, Video BIOS, and Adapter ROM

❑ **SIZE:**

220mm x 250mm

❑ **BIOS:**

- Award (Support stanby power down mode) or
- AMI (Not support standby power down mode)

❑ **Green PC:**

Meet EPA Green PC standard: power consumption under 30W on the standby mode

1-2 SOFTWARE COMPAT- IBILITY

- ❑ MS-DOS 3.3, MS-DOS 4.01, 5.0, 6.0, 6.2
 - ❑ IBM OS/2 Ver 1.2, 2.0, 2.1 MS OS/2 Ver 1.1
 - ❑ MS Windows 3.0, 3.1, Novell Netware/386 3.01, 3.11
 - ❑ Lotus 1-2-3 Ver. 2.0, 2.01 Lotus 1-2-3 Ver. 3.0
 - ❑ AutoCAD 2.6, AutoCAD R10, R11
 - ❑ OrCAD 3.01
 - ❑ UNIX (SCO V386) and..., etc.
-

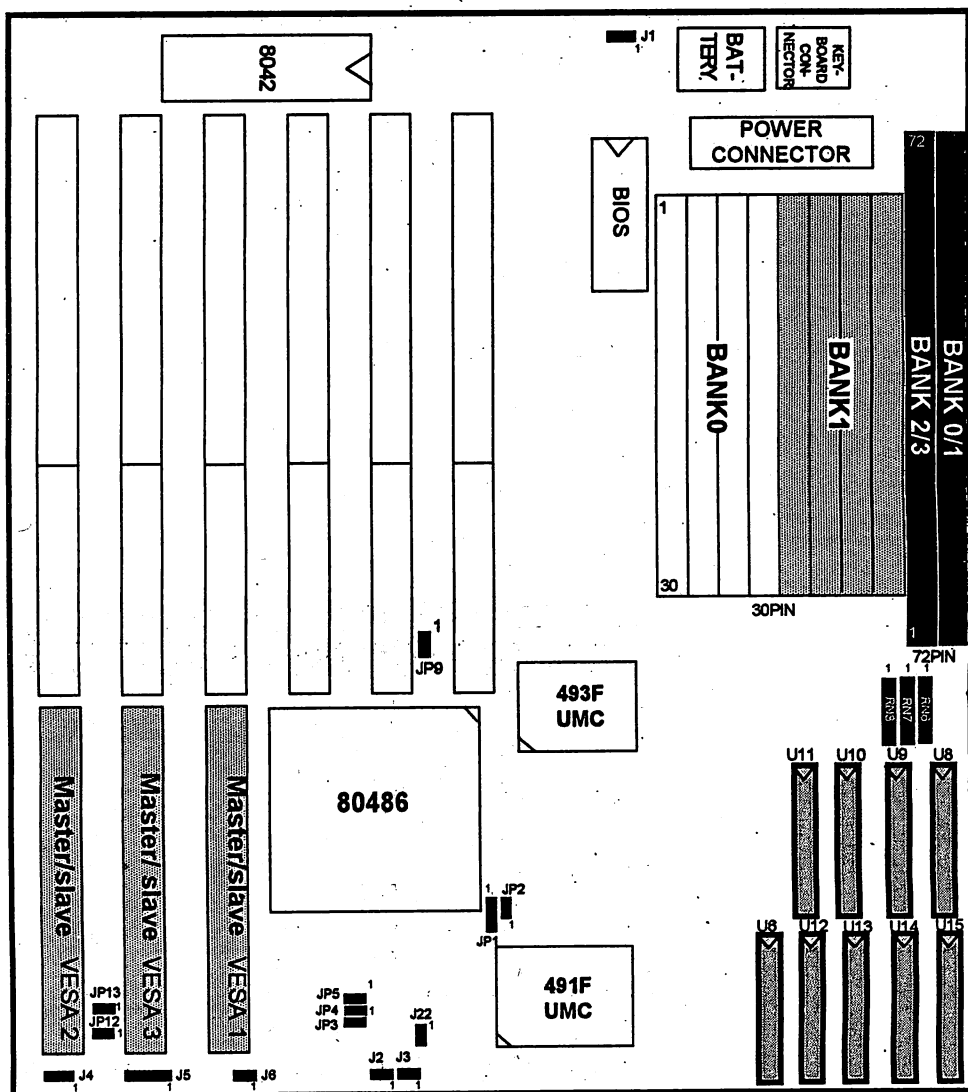
1-3 PERFORM- ANCE

	LANDMARK V2.0			LANDMARK V1.14	POWER METER V1.7
	CPU (MHz)	FPU (MHz)	VIDEO (Chr/ms)	(MHz)	(MIPS)
486SX-25	83.62	7.10	8192	114.1	11.0
486SX-33	111.42	9.42	10802	151.9	14.9
486DX-33	111.42	283.99	10802	151.9	14.9
486DX-40	133.76	340.93	12136	182.3	17.6
486DX-50	165.54	421.89	13284	—	21.3
486DX2-50	160.74	411.74	7992	—	21.3
486DX2-66	222.10	566.88	10802	—	27.1
Cyrix Dx-40	131.74	383.97	12136	121.4	15.8

* Landmark V2.0 Video performance tested by GL-5426 VESA bus VGA card.

1-4 MAINBOARD LAYOUT

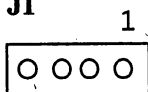
The next page contain the mainboard layout:



LAYOUT

1-5 MAINBOARD CONNECTORS AND JUMPER SETTINGS

J1



External Battery Connector

- 1.+VDD (External battery power input)
- 2.No connect
- 3.GND
- 4.GND

J2



Turbo LED

J3



Turbo Switch

Open: High speed or speed change by keyboard

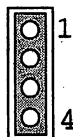
{CTRL} {ALT} {+} : High speed or speed
change by turbo switch

{CTRL} {ALT} {-} : Low speed



Short: Low speed

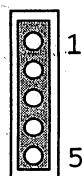
J4



Speaker Jumper

1. Speaker out
2. No connect
3. GND
4. +5V DC

J5



Power LED & Keylock

1. LED output
2. GND
3. GND
4. Keylock
5. GND

J6



Reset Switch

1. GND
2. Power good

J22



1

50 MHz CPU Clock Setup

- 1-2 Default



1

- 2-3 For 50MHz

JP1-JP2: CPU Mode Setup

JP3-JP5: CPU Clock Setup

(Please refer to the next page)

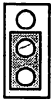
JP9



1

The Power 9000 Chipset Based VGA Cards Setup

- 1-2 Default



1

- 2-3 For power 9000

JP12



VL-Bus Clock Setup

Open: $\leq 33\text{MHz}$

Short: $> 33\text{MHz}$

JP13



VL-Bus Wait State Setup

Open=0WS

Short=1WS (Default)

**1-6
CPU TYPE
AND CPU
CLOCK REF-
ERENCE TA-
BLE**

CPU	OSC
486SX-25	25MHz
486SX-33	33MHz
487SX-25	25MHz
487SX-33	33MHz
486DX-33	33MHz
486DX-40	40MHz
486DX-50	50MHz
486DX2-50	25MHz
486DX2-66	33MHz
OVERDRIVE-25	25MHz
OVERDRIVE-33	33MHz

This board is fitted with special IC which allows the user to choose a different CPU frequency just by changing the jumper setting for the clock generator.

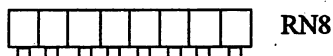
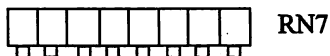
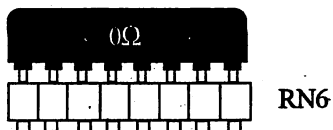
As a result, there is no more need for replacing the oscillator crystal. But you must set correct jumper setting before turning on the power and after replacing the different type CPU.

CPU MODE SELECT		
	JP1	JP2
486SX	2-3	OPEN
486DX/DX2	1-2,3-4	1-2
487SX/ODP	1-2,3-4	2-3

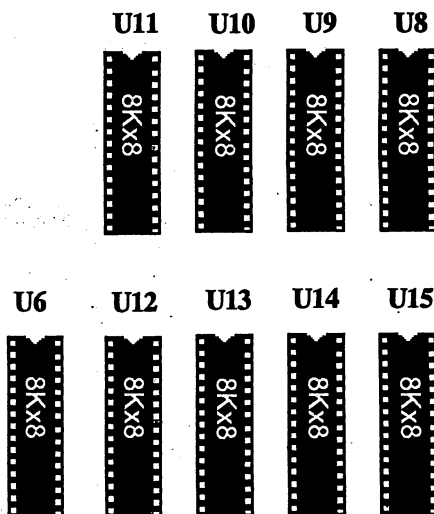
CPU CLOCK SELECT					
CPU CLOCK	JP3	JP4	JP5	JP12	J22
25MHz	SHORT	OPEN	OPEN	OPEN	1-2
33MHz	SHORT	SHORT	SHORT	OPEN	1-2
40MHz	SHORT	SHORT	OPEN	SHORT	1-2
50MHz	OPEN	OPEN	SHORT	SHORT	2-3

**1-7
CACHE
RAM SIZE
CONFIGURA-
TION**

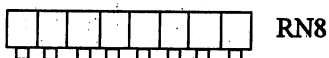
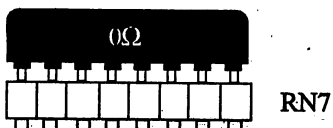
64K CACHE



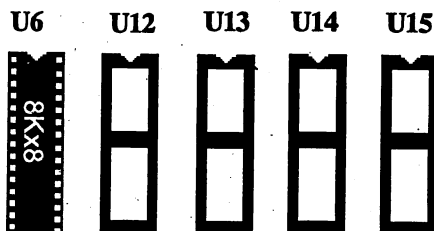
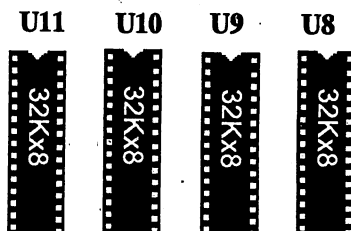
TAG RAM: 8Kx8 1 pcs (U6)
DATA RAM: 8Kx8 8 pcs (U8-U11)
(U12-U15)



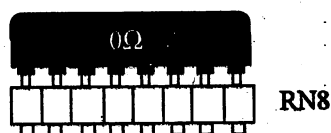
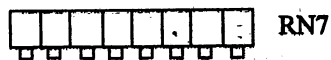
128K CACHE



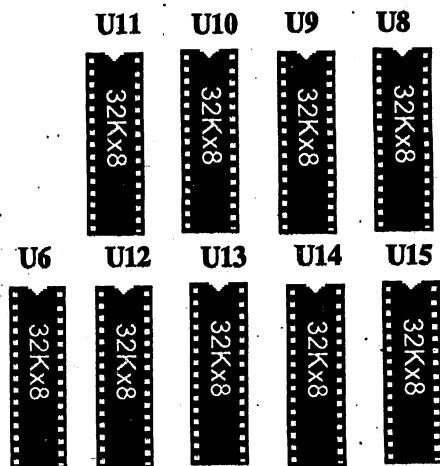
TAG RAM: 8Kx8 1 pcs (U6)
DATA RAM: 32Kx8 4 pcs (U8-U11)



256K CACHE



TAG RAM: 32Kx8 or
16Kx8 1 pcs (U6)
DATA RAM: 32Kx8 8 pcs (U8-U11)
(U12-U15)



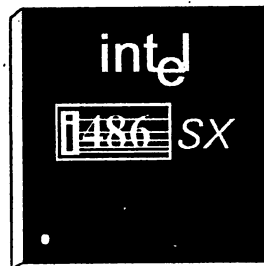
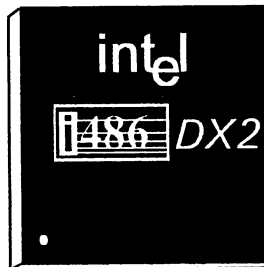
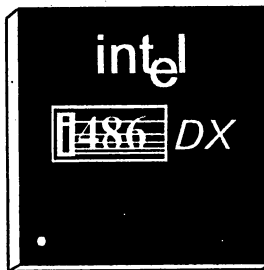
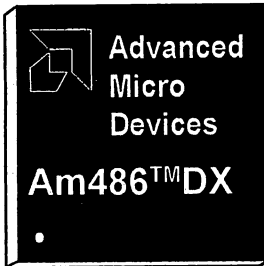
2

CONFIGURATION

This chapter briefly describes the major features of this mainboard. It covers the following:

- ❑ Microprocessor/Math Coprocessor/Upgrade Microprocessor
- ❑ The UMC Chipset
- ❑ Shadow RAM & Memory Remapping
- ❑ Memory
- ❑ Memory Bank configuration
- ❑ Keyboard Controller
- ❑ Local bus Pin definition

2-1 MICRO- PROCESSOR

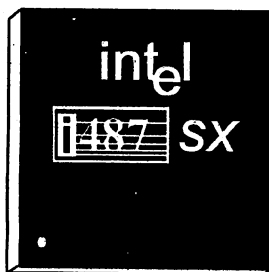


The 80486DX microprocessor features 32-bit architecture with on-chip memory management and floating point and cache memory units. It has all the features of the 80386 with enhancements to increase performance. The instruction set includes the complete 80386 instruction set along with extensions to serve new applications. The chip memory management unit, usually as initialized as (MMU) is completely compatible with the 80386 MMU. The 80486 brings the 80387 math coprocessor on-chip.

All software written for the 80386 microprocessor, 80387 coprocessor, and previous members of the 86/87 architectural family, will run on it without any modifications. Moreover, its on-chip cache memory allows frequently used data and code to be stored on-chip reducing accesses to the external bus. RISC design techniques have been used to reduce instruction cycle times. A burst bus feature enables fast cache fills. All of these features combined, lead to performance greater than twice that of a 80386 microprocessor.

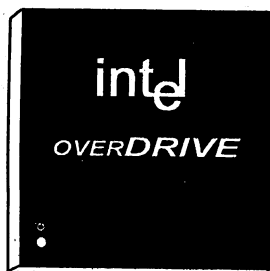
The 486DX2 is a 32-bit architecture microprocessor which includes an integer processing unit, a floating point unit, an 8Kbyte cache, and a memory management unit. 100% pin compatible with 486DX, it contains all the features of the 486DX CPU and needs no upgrading CPU like 487SX to speed up the system performance. The internal core of the 486DX2 operates at twice the frequency of the external bus and there by provides internal execution at twice the speed of the input clock.

The Intel 486SX microprocessor provides a new entry to powerful 486 desktop computing. The 486SX is a 32 bit architecture which includes an integer processing unit, an 8Kbyte cache, and a memory management unit. This microprocessor is compatible with Intel 486DX as well as all version of the 386 microprocessor.



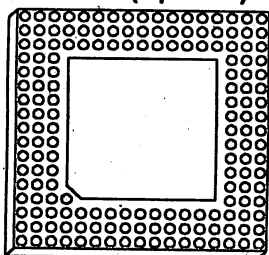
P1

The 487SX Math Coprocessor provides optional math upgrade capability for end-users who want increased floating point performance with more than 2100 software packages that were designed to use Intel Math Coprocessors. 169-Pin Grid Array Package for 487SX Math Coprocessor includes an integer processing unit, a floating point unit, an 8Kbyte cache, and memory management unit. It contains all the features of the 486DX CPU.



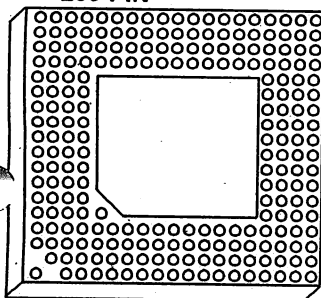
P1
169 PIN (Optional)

The ODP486(OVERDRIVE) microprocessor is a 32 bit architecture which includes an integer processing unit, a floating point unit, an 8Kbyte cache, and a memory management unit. It contains all the features of the 486DX CPU, and it is 100% pin compatible with the 487SX math coprocessor. The internal core of the P23T operates at twice the frequency of the external bus and thereby provides internal execution at twice the speed of the input clock.



P1
239 PIN

We support two types CPU socket for customer, the 169 pin PGA socket (optional), 239 pin PGA socket (Default). For 169 pin or 239 pin PGA socket. Please follow the following description to install the CPU.



When plugging the CPU into the PGA socket, make sure that the orientation of the CPU to the socket is correct, so as to avoid damage being done to the CPU.

Before install or replace the different type CPU, make sure the power is off and before turning on the power, make sure the frequency that come out from clock generator matches the CPU frequency.

P1

2-2 THE UMC CHIPSET

The UMC82C491 single chipset from UMC allows the programming of many system board functions. The set comprises single ASIC (Application Special Integrated Circuit) chips that enable the CPU and AT bus clock rates to be programmed, in addition to memory and I/O wait states and delays. DRAM type and Shadow RAM capability can also be set. The Chipset consists of the:

- 82C491 CPU/AT and DRAM CACHE controller
Bus controller, peripherals controller,
RTC controller
 - 82C493 Buffer chipset
-

2-3 SHADOW RAM & MEMORY REMAPPING

The 82C491 has built-in support for shadowing different areas of memory (which include system BIOS, video BIOS, and adapter ROM).

Figure 2-1 represents memory allocation for a maximum of 64MB of memory on board, with an exploded view of the first 1MB.

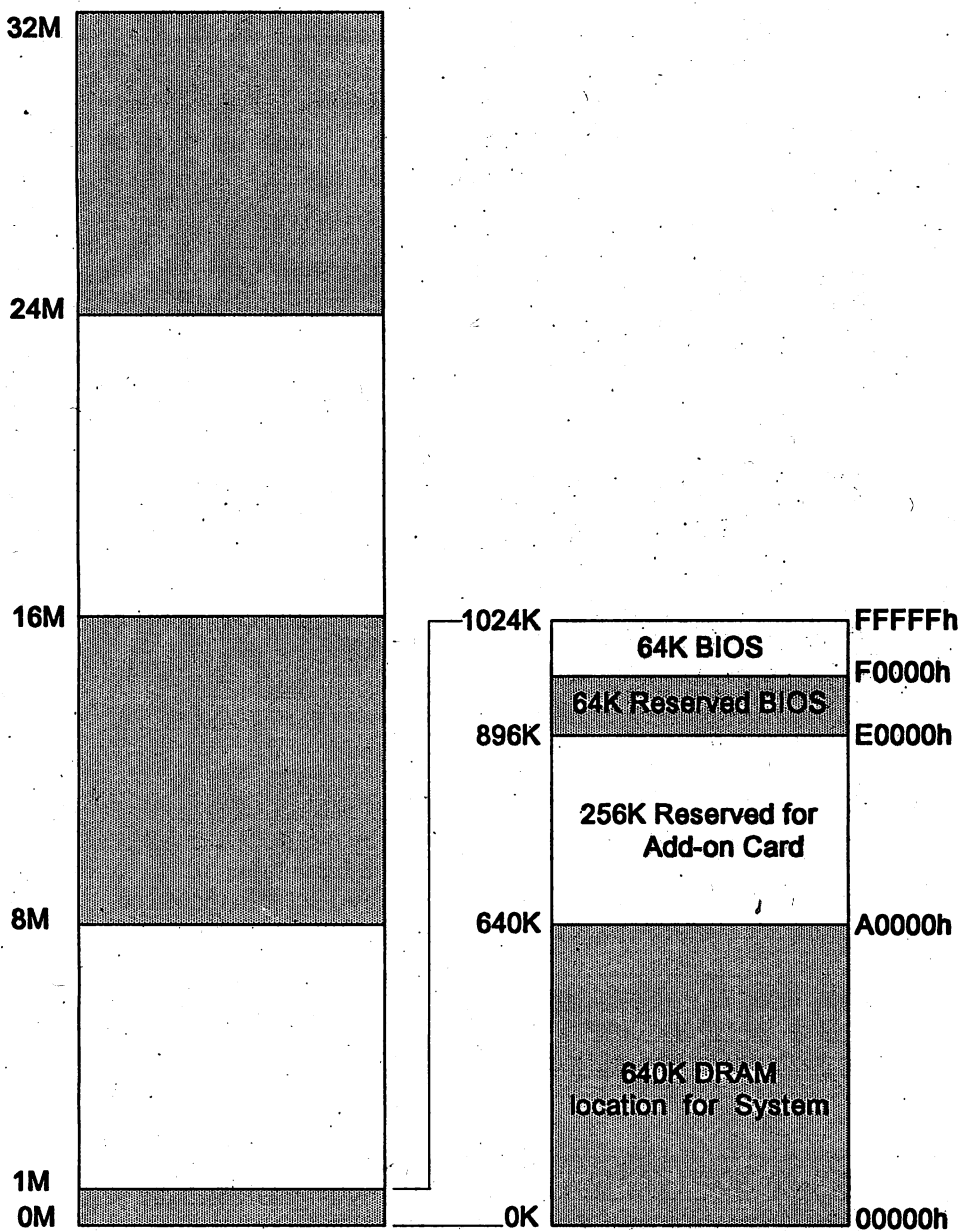


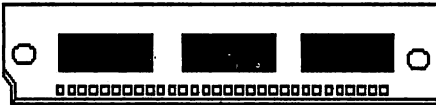
Fig. 2-1 UMC Chipset System Block Diagram

2-4 MEMORY

DRAM chips mounted as 30-pin SIMMs (Single In-Line Memory Modules), are required for this mainboard. Various types of SIMM modules, shown below, are acceptable.



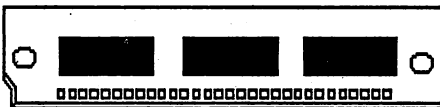
256K x 9-bit SIMM
256K by 1-bit DRAM x 8 pcs
(for 8-bit data) +
256K by 1-bit DRAM x 1 pc
(for parity-bit)



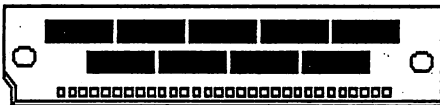
256K x 9-bit SIMM
256K by 4-bit DRAM x 2 pcs
(for 8-bit data) +
256K by 1-bit DRAM x 1 pc
(for parity-bit)



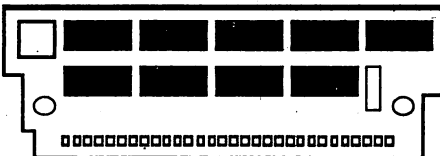
1M x 9-bit SIMM
1M by 1-bit DRAM x 8 pcs
(for 8-bit data) +
1M by 1 bit DRAM x 1 pc
(for parity-bit)



1M x 9-bit SIMM
1M by 4-bit DRAM x 2 pcs
(for 8-bit data) +
1M by 1 bit DRAM x 1pc
(for parity-bit)



4M x 9-bit SIMM
4M by 1-bit DRAM x 8 pcs
(for 8bit data) +
4M by 1-bit DRAM x 1 pc
(for parity-bit)



16M x 9-bit SIMM
4M by 1-bit DRAM x 32 pcs
(for 8bit data) +
4M by 1-bit DRAM x 4 pc
(for parity-bit)

2-5 MEMORY & BANK CONFIGURA- TION

1	SIMM 8	30
1	SIMM 7	30 BANK B
1	SIMM 6	30 (BANK 1)
1	SIMM 5	30
1	SIMM 4	30
1	SIMM 3	30 BANK A
1	SIMM 2	30 (BANK 0)
1	SIMM 1	30

No. Memory	SIMM Type Selection		
	Size	Bank A	Bank B
1	1MB	256KBx4	-
2	2MB	256KBx4	256KBx4
3	4MB	1MBx4	-
4	5MB	1MBx4	256KBx4
5	8MB	1MBx4	1MBx4
6	16MB	4MBx4	-
7	17MB	4MBx4	256KBx4
8	20MB	4MBx4	1MBx4
9	32MB	4MBx4	4MBx4
10	64MB	16MBx4	-

A. If your M/B supports 30 pin SIMM sockets only, please follow the below suggested Bank and Memory configuration table.

BANK D (BANK 0/1)		
BANK C (BANK 2/3)		
1	SIMM8	30
1	SIMM7	30
1	SIMM6	30
1	SIMM5	30
1	SIMM4	30
1	SIMM3	30
1	SIMM2	30
1	SIMM1	30

BANK B (BANK 1)

BANK A (BANK 0)

No. Memory		SIMM Type Selection			
	Size	Bank A	Bank B	Bank C	Bank D
1	1MB	256KBx4			
2	1MB				1MBx1
3	2MB	256KBx4	256KBx4		
4	2MB			1MBx1	1MBx1
5	2MB				2MBx1
6	3MB	256KBx4	256KBx4	1MBx1	
7	3MB			1MBx1	2MBx1
8	3MB		256KBx4	1MBx1	1MBx1
9	4MB	256KBx4	256KBx4	2MBx1	
10	4MB	1MBx4			
11	4MB			2MBx1	2MBx1
12	4MB				4MBx1
13	5MB	256KBx4	1MBx4		
14	5MB	256KBx4			4MBx1
15	5MB	1MBx4		1MBx1	
16	5MB			4MBx1	1MBx1
17	6MB	1MBx4		2MBx1	
18	6MB		256KBx4	4MBx1	1MBx1
19	7MB		256KBx4	2MBx1	4MBx1
20	7MB		1MBx4	2MBx1	1MBx1
21	8MB	1MBx4	1MBx4		
22	8MB	1MBx4		4MBx1	
23	8MB			4MBx1	4MBx1
24	8MB				8MBx1

No.	Memory	SIMM Type Selection			
		Size	Bank A	Bank B	Bank C Bank D
25	9MB	256KBx4			8MBx1
26	9MB	1MBx4	1MBx4	1MBx4	1MBx1
27	9MB	1MBx4	1MBx4	1MBx4	2MBx1
28	10MB	1MBx4	1MBx4	1MBx4	2MBx1
29	10MB	256KBx4	256KBx4		8MBx1
30	10MB				2MBx1 8MBx1
31	12MB	1MBx4	1MBx4	4MBx1	
32	12MB	1MBx4		8MBx1	
33	12MB			4MBx1	8MBx1
34	13MB		1MBx4	1MBx1	8MBx1
35	16MB	1MBx4	1MBx4	8MBx1	
36	16MB		1MBx4	4MBx1	8MBx1
37	16MB	4MBx4			
38	16MB			8MBx1	8MBx1
39	17MB	256KBx4	4MBx4		
40	18MB	4MBx4		2MBx1	
41	19MB		4MBx4	2MBx1	1MBx1
42	20MB	1MBx4	4MBx4		
43	20MB	4MBx4		4MBx1	
44	21MB		4MBx4	1MBx1	4MBx1
45	22MB	1MBx4	4MBx4	2MBx1	
46	24MB	4MBx4		8MBx1	
47	25MB		4MBx4	1MBx1	8MBx1
48	28MB	1MBx4	4MBx4	8MBx1	
49	32MB	4MBx4	4MBx4		
50	33MB	4MBx4	4MBx4	1MBx1	
51	34MB	4MBx4	4MBx4	2MBx1	
52	36MB	4MBx4	4MBx4	4MBx1	
53	40MB	4MBx4	4MBx4	8MBx1	
54	64MB	16MBx4			

B. If your M/B supports 30 pin SIMM +72 pin SIMM sockets, please follow the below suggested Bank and Memory configuration table.

2-6 KEYBOARD CONTROLLER

The 8042 processor is programmed to support the keyboard serial interface. The keyboard controller receives serial data from the keyboard, checks its parity, translates scan codes, and presents it to the system as a byte of data in its output buffer. The controller can interrupt the system when data is placed in its output buffer, or wait for the system to poll its status register to determine when data is available.

Data is sent to the keyboard by first polling the controller's status register to determine when the input buffer is ready to accept data. Then it is written to the input buffer.

Each byte of data is sent to the keyboard serially with an odd parity bit automatically inserted. The keyboard is required to acknowledge all data transmissions; another byte of data will not be sent to the keyboard until acknowledgment is received for the previous byte sent. The "output buffer full" interrupt may be used for both send and receive routines.



2-7 VESA LOCAL BUS PIN DEFINITION

B		A	
DAT00	01	DAT01	
DAT02	02	DAT03	
DAT04	03	gnd	
DAT06	04	DAT05	
DAT08	05	DAT07	
gnd	06	DAT09	
DAT10	07	DAT11	
DAT12	08	DAT13	
vcc	09	DAT15	
DAT14	10	gnd	
DAT16	11	DAT17	
DAT18	12	vcc	
DAT20	13	DAT19	
gnd	14	DAT21	
DAT22	15	DAT23	
DAT24	16	DAT25	
DAT26	17	gnd	
DAT28	18	DAT27	
DAT30	19	DAT29	
vcc	20	DAT31	
ADR31	21	ADR30	
gnd	22	ADR28	
ADR29	23	ADR26	
ADR27	24	gnd	
ADR25	25	ADR24	
ADR23	26	ADR22	
ADR21	27	vcc	
ADR19	28	ADR20	
gnd	29	ADR18	
ADR17	30	ADR16	
ADR15	31	ADR14	
vcc	32	ADR12	
ADR13	33	ADR10	
ADR11	34	ADR08	
ADR09	35	gnd	
ADR07	36	ADR06	
ADR05	37	ADR04	
gnd	38	WBACK#	
ADR03	39	BEC#	
ADR02	40	vcc	
nc	41	BE1#	
RESET#	42	BE2#	
D/C#	43	gnd	
MIO#	44	BE3#	
W/R#	45	ADS#	
RDYRTN#	48	LRDY#	
gnd	49	LDEV<g>#	
RC9	50	LREQ<g>#	
BRDY#	51	gnd	
BLAST#	52	LGNT<g>#	
ID0	53	vcc	
ID1	54	ID2	
gnd	55	ID3	
LCLK	56	ID4	
vcc	57	LKEN#	
LBS16#	58	LEADS#	

This bus is defined for high speed peripherals.

3

INSTALLATION

This chapter provides information for you to set up a working system based on this mainboard. Before removing the board from its anti-static bag, please read the section below about static electricity precautions.

3-1 STATIC ELECTRICITY PRECAU- TIONS

Static electricity is a constant danger to computer systems. The charge that can build up in your body may be more than sufficient to damage integrated circuits on the system board. It is, therefore, important to observe basic precautions whenever you are going to handle, or use, computer components. Although areas with a humid climate are much less prone to static build-up, it is always best to safeguard against accidental damage that may result in expensive repairs. The following measures should generally be sufficient to protect your equipment from static discharge:

- Touch a grounded metal object to discharge the static electricity in your body (or, preferably, wear a grounded wrist strap).
- When unpacking and handling the board and other system components, all materials should be placed on an anti-static surface.

- When handling individual cards, boards, or modules, be careful to avoid contact with the components on them, and also with the "golden finger" connectors that plug into the expansion bus.
-

3-2 PERIPHERALS REQUIRED

- ☐ Your mainboard;
- ☐ a chassis similar to the IBM Baby AT in size, or one with identical mounting holes;
- ☐ an IBM-AT power supply, or compatible; we recommend that you use at least a 200 Watt power supply;
- ☐ a disk controller card with 1:1 page interleave feature;
- ☐ a serial/parallel interface card;
- ☐ an IBM-AT keyboard, or compatible;
- ☐ a 4.5V to 6V battery, optional;
- ☐ at least one floppy disk drive [360KB, 720KB, 1.2MB, or 1.44MB, 2.88MB];
- ☐ an IBM-AT display card: CGA, MDA, EGA, VGA, or compatible;
- ☐ a monitor that corresponds to the display card;
- ☐ an external speaker;
- ☐ flat ribbon cables to connect the hard/floppy disk controller to the drives;
- ☐ MS-DOS version 3.3, or later, PC-DOS version 3.3, or later, or OS/2.

BUILDING UP A SYSTEM

3-3

- 1) Install RAM SIMMs onto the mainboard (See Section 2-5).
- 2) Install any DIPs for cache memory (See Sections 1-7 for further information).
- 3) When fastening the mainboard to the case, make sure the proper length standoffs and phillips screws are used to insure the board is secure and level within the chassis.
- 4) Install an interface card.
- 5) Install an MDA, CGA, EGA, or VGA display card in its slot. The mainboard will sense whether the card is monochrome or color.
- 6) Plug the keyboard into the keyboard connector in the back of the system unit (Fig. 3-1).
- 7) Connect the monitor cable to the display card.
- 8) Connect the power supply connectors to PS1/PS2 (Fig. 3-2).
- 9) Install the disk controller card. Mount the disk drives into their respective frames. Connect the hard disk/floppy disk ribbon cables from the drives to the controller card. Connect the disk drives to their power sources.
- 10) This board has a rechargeable battery on board; however, a connector for an external backup battery (4.5V or 6V) "BATT" is provided.
- 11) For those who have the IBM PC/AT chassis, or equivalent, plug the speaker connector and the "Power LED and KEYLOCK" connectors into the front of the system unit.
- 12) Complete cable connections and jumper settings (See Pg. 4 for Mainboard layout and 1-5, Pg. 5 & 6 for jumpers and connectors).
- 13) Please remember to "turn off" the power before plugging in/out any add-on-card.

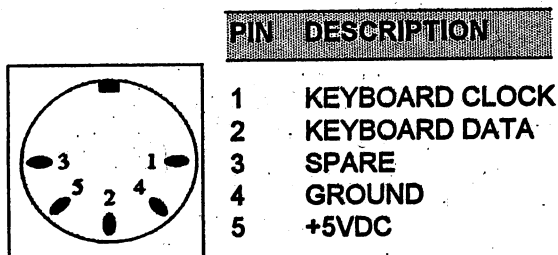


Figure 3-1 Keyboard Connector

1	■	POWER GOOD	Orange
2	■	+5V	Red
3	■	+12V	Yellow
4	■	- 12V	Blue
5	■	GROUND	Black
6	■	GROUND	Black
1	■	GROUND	Black
2	■	GROUND	Black
3	■	- 5V	White
4	■	+5V	Red
5	■	+5V	Red
6	■	+5V	Red

Figure3-2 Power Supply Connector

4

AWARD BIOS SETUP

ROM ISA BIOS (2C4X2C31) CMOS SETUP UTILITY AWARD SOFTWARE, INC.	
STANDARD CMOS SETUP BIOS FEATURES SETUP CHIPSET FEATURES SETUP POWER MANAGEMENT SETUP LOAD SETUP DEFAULTS	PASSWORD SETTING IDE HDD AUTO DETECTION SAVE & EXIT SETUP EXIT WITHOUT SAVING
ESC: QUIT F10: Save & Exit Setup	↓ → ↑ ← : SELECT ITEM (Shift)F2: Change Color
Time, Date, Hard Disk Type....	

Figure 4-1 Setup Program Initial Screen

Award's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

Entering Setup

Power on the computer and press **** immediately will allow you to enter Setup.

4-1 STANDARD CMOS SETUP

Choose the "STANDARD CMOS SETUP" option from the INITIAL SETUP SCREEN Menu (Fig.4-1) and the below screen is displayed. This standard Setup Menu allows users to configure system components such as date, time, hard disk drive, floppy drive, display, and memory. Once a field is highlighted, on-line help information is displayed in the left bottom of the Menu screen.

ROM ISA BIOS (2C4X2C31) STANDARD CMOS SETUP AWARD SOFTWARE, INC.					
Date (mm:dd:yy) :Wed, Dec 8 1993					
Time (hh:mm:ss) :9:16:15					
	CYLS.	HEADS	PRECOMP	LANDZONE	SECTORS
Drive C : None (0Mb)	0	0	0	0	0
Drive D : None (0Mb)	0	0	0	0	0
Drive A : 1.2M,5.25 in.	Base Memory : 640K Extended Memory : 2355K Expanded Memory : 0K Other Memory : 384K <hr/> Total Memory : 24576K				
Drive B : None					
Video: EGA/VGA					
Halt On:All Errors					
<div> <div>ESC: QUIT F1:Help</div> <div> ↓↑ ←:SELECT ITEM (Shift)F2:Change Color </div> <div> PU/PD/ +/ -:Modify F3:Toggle Calendar </div> </div>					

Figure 4-2 CMOS Setup Screen

P.S. Please refer to APPENDIX page (46-47) for setting up the HDD type.

4-2 BIOS FEATURES SETUP

By choosing the "BIOS FEATURES SETUP" option from the INITIAL SETUP SCREEN Menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the mainboard.

ROM ISA BIOS (2C4X2C31) BIOS FEATURES SETUP AWARD SOFTWARE, INC.					
Virus Warning	:	<input checked="" type="checkbox"/> Disabled	System BIOS Shadow	:	Enabled
IDE HDD Block Mode	:	Disabled	Video BIOS Shadow	:	Enabled
Gate A20 Option	:	Fast	C8000-CBFFF Shadow	:	Disabled
Swap Floppy Drive	:	Disabled	CC000-CFFFF Shadow	:	Disabled
Boot Up NumLock Status	:	On	D0000-D3FFF Shadow	:	Disabled
Boot Up Floppy Seek	:	Enabled	D4000-D7FFF Shadow	:	Disabled
Boot Sequence	:	A,C	D8000-DBFFF Shadow	:	Disabled
CPU Internal Cache	:	Enabled	DC000-DFFFF Shadow	:	Disabled
External Cache	:	Enabled	E0000-E3FFF Shadow	:	Disabled
Typematic Rate Setting	:	Disabled	E4000-E7FFF Shadow	:	Disabled
Typematic Rate (Chars/Sec)	:	6	E8000-EBFFF Shadow	:	Disabled
Typematic Delay (Msec)	:	250	EC000-EEFFF Shadow	:	Disabled
Security Option	:	Setup	Esc:Quit ↓ → ← : Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values (Shift)F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults		

Figure 4-3 BIOS FEATURES SETUP

4-3 CHIPSET FEATURES SETUP

By choosing the "CHIPSET FEATURES SETUP" option from the INITIAL SETUP SCREEN Menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the mainboard.


ROM ISA BIOS (2C4X2C31) CHIPSET FEATURES SETUP AWARD SOFTWARE, INC.			
Auto Configuration	: 	System BIOS Cacheable	: Disabled
AT Clock	: CPUCLK/6	Video BIOS Cacheable	: Disabled
Keyboard Clock	: CPUCLK/6	Slow Refresh	: Disabled
IO Recovery For ISA/PCB	: BCLK/9/9	Memory Remap	: Disabled
Cache Read Burst	: 3-2-2-2	DRAM Type	: Normal Page
Cache Write Wait State	: 2 WS	DMA/Master Cycle	: Hold 2-3T
DRAM Wait State	: 2 WS	Non-Cacheable Block 1	: Disabled
		Block 1 Start Address	: 0K
		Block 1 Size	: 16KB
		Esc: Quit ↓ → ← : Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values (Shift)F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults	

Figure 4-4 CHIPSET FEATURES SETUP

Note1:

When chose the "AUTO config function: Enabled". This BIOS automatically detects the CPU speed. It will auto-configure the bus frequency, DRAM speed, cache read/write cycle.

4-4 POWER MAN- AGEMENT SETUP

By "POWER MANAGEMENT SETUP" option from the INITIAL SETUP SCREEN Menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the mainboard.

ROM ISA BIOS (2C4X2C31) POWER MANAGEMENT SETUP AWARD SOFTWARE, INC.	
Power Management	: Disabled
HDD Standby Timer	: Disabled
Display Power Down	: Disabled
System Slow Down	: Disabled
System Power Down	: Disabled
Esc: Quit ↓ → ← : Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values (Shift)F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults	

Figure 4-5 POWER MANAGEMENT SETUP

A. Selecting Power Management Mode :

- Disabled:** This mode will disable the power management function
 - Max. Power saving:** This mode can function the below 4 timers at the defaulted Max. figures
 - Min. Power saving:** This mode can function the below 4 timers at the defaulted Min. figures
 - User define:** Users can define their own proper delay timings.
- HDD Standby Timer :**
When "Power Management" parameter be set in user defined mode, this HDD standby timer can be set from 1 min. to 15 min.

2. Display Power Down Timer :

The setting rule of this timer same as the first timer

3. System Slow Down Timer :

The setting rule of this timer same as the first timer, but the setting margin is from 10sec to 55sec.

4. System Power Down Timer :

The setting rule of this timer same as the first timer

B. Standby Mode "Power Saving"

This board can supports "standby mode" Green PC function by using Award BIOS. Following are standby mode power saving options:

-Slow down the CPU clock to 8MHz

-Remove the V/H SYNC signals from the video monitor

-Turn off the HDD power

1. When system detect that the key board and mouse don't work any longer, it will start the "Power Management Setup" function.

2. To enjoy the power management function, you must enter your system "Power Management Setup" screen to set the parameter of Power Management Mode for activating power saving options before you start to boot the DOS..

3. Once one of the 4 timers time out, the system will implement one of the three power saving (activity) options mapped by the relative timer.

4. The system will remain in standby mode until the keyboard, HDD, FDC or mouse be used.

Once the user touch the keyboard or mouse, the monitor start to display and the system speed come back to original normal speed from 8MHz but the HDD will not resume until the read or write command is executed.

4-5 LOAD SETUP DEFAULTS

"LOAD SETUP DEFAULTS" loads the default system values directly from ROM. If the stored record created by the Setup program becomes corrupted (and therefore unusable), these defaults will load automatically when you turn the computer on.

ROM ISA BIOS (2C4X2C31) CMOS SETUP UTILITY AWARD SOFTWARE, INC.	
STANDARD CMOS SETUP	PASSWORD SETTING
BIOS FEATURES SETUP	IDE HDD AUTO DETECTION
CHIPSET FEATURES SETUP	SAVE & EXIT SETUP
POWER MANAGEMENT	SAVING
LOAD SETUP DEFAULT	Load SETUP Default (Y/N)? Y
ESC: QUIT	↓↑← :SELECT ITEM
F10:Save & Exit Setup	(Shift)F2:Change Color
Time, Date, Hard Disk Type....	

Figure 4-6 Load Setup Defaults Screen

4-6 CHANGE PASSWORD

To change the password, choose the **"PASSWORD SETTING"** option from the Setup main menu and press [Enter].

1. If the CMOS is bad or this option has never been used, there is default password which is stored in the ROM. The screen will display the following messages:

Enter Password:

Press the [Enter] key and continue to change the password.

2. If the CMOS is good or this option has been used to change the default password, the user is asked for the password stored in the CMOS. The screen will display the following message:

Confirm Password:

Enter the correct password and continue to change the password.

3. After pressing the [Enter] key (ROM password) or current password (user-defined password), you can change the password stored in the CMOS. The password can be at most 8 characters long.

Remember, to enable this feature. You must first select the "Security Option" either "Setup", or "System" in the BIOS FEATURES SETUP (Please refer to Figure 4-3).

**4-7
AUTO
DETECT
HARD DISK**

"IDE HDD AUTO DETECTION" This utility can AUTO DETECT IDE HARD DISK TYPE, when you unknow the HARD DISK TYPE. You can use this utility, the utility can to help you self-detect correct HARD DISK TYPE.

ROM ISA BIOS (2C4X2C31) CMOS SETUP UTILITY AWARD SOFTWARE, INC.					
	CYLS.	HEADS	PRECOMP	LANDZONE	SECTORS
Drive C: (124Mb)	936	16	65535	935	17
Drive D: (0Mb)	0	0	0	0	0
Do you accept this drive D (Y/N)? Y					
ESC : Skip					

Figure 4-7 IDE HDD Auto Detection Screen

**4-8
SAVE & EXIT
SETUP**

"SAVE & EXIT SETUP". If you select this and press the [enter] key, the values entered in the setup utilities will be recorded in the CMOS memory of the chip set. The microprocessor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

**4-9
EXIT
WITHOUT
SAVING**

"EXIT WITHOUT SAVING" Selecting this option and pressing the [Enter] key lets you exit the Setup program without recording any new values or changing old ones.

5

AMI BIOS SETUP

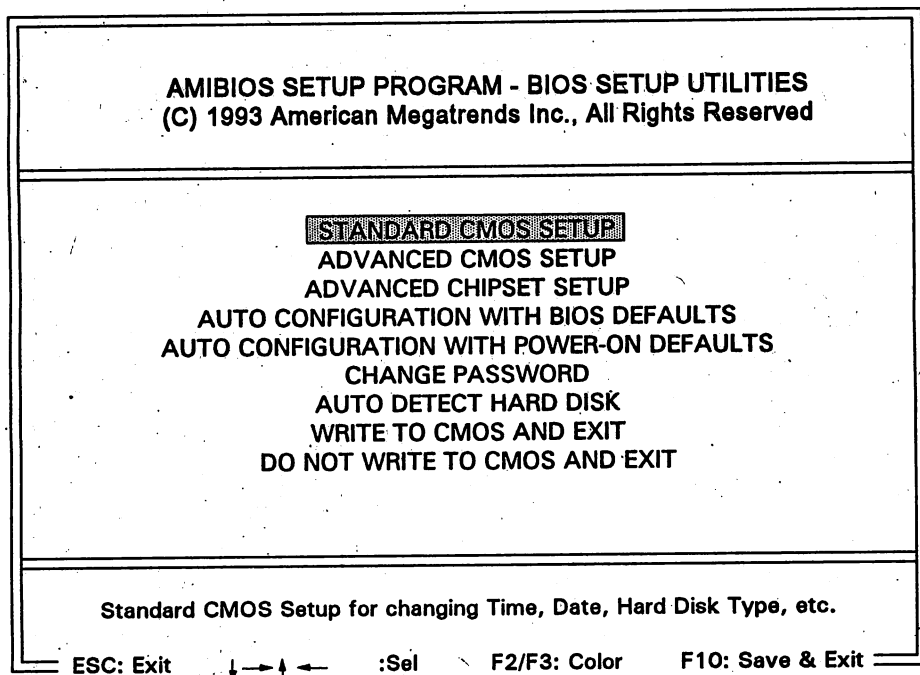


Figure 5-1 Setup Program Initial Screen

AMI BIOS is designed into the motherboard to allow users to configure their systems. At boot-up, after memory tests have been completed, press the key. The above screen is displayed.

5-1 STANDARD CMOS SETUP

Choose the **STANDARD CMOS SETUP** option from the **INITIAL SETUP SCREEN** Menu (Fig. 5-1) and the below screen is displayed. This standard Setup Menu allows users to configure such system components as date, time, hard disk drive, floppy drive, display, and memory. Once a field is highlighted, on-line help information is displayed in the left bottom of the Menu screen.

AMIBIOS SETUP PROGRAM - STANDARD CMOS SETUP (C) 1993 American Megatrends Inc., All Rights Reserved										
Date(mn/date/year) : Tue, Aug 03 1993				Base memory size :640 KB						
Time(hour/min/sec) : 11:44:38				Ext. memory size :15616KB						
				Cyln Head WPcom LZone Sect Size						
Hard disk C: type : Not Installed										
Hard disk D: type : Not Installed										
Floppy drive A : : 1.2 MB, 5¼"										
Floppy drive B : : Not Installed										
Primary display : VGA/PGA/EGA										
Keyboard : Installed										
				Sun	Mon	Tue	Wed	Thu	Fri	Sat
				28	29	30	1	2	3	4
				5	6	7	8	9	10	11
				12	13	14	15	16	17	18
Month:Jan, Feb,.....Dec				19	20	21	22	23	24	25
Date:01,02,03.....31										
Year:1901,1902.....2099				26	27	28	29	30	31	1
ESC:Exit, →←:Select, F2/F3:Color PU/PD:Modify				2	3	4	5	6	7	8

Figure 5-2 CMOS Setup Screen

P.S. Please refer to APPENDIX page.(46-47) for setting up the HDD type.

5-2 ADVANCED CMOS SETUP

By choosing the "ADVANCED CMOS SETUP" option from the INITIAL SETUP SCREEN Menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the mainboard.

AMIBIOS SETUP PROGRAM - ADVANCED CMOS SETUP (C) 1993 American Megatrends Inc., All Rights Reserved	
Typematic Rate Programming	: Disabled
Typematic Rate Delay (msec)	: 500
Typematic Rate (Chars/sec)	: 30
Above 1 MB Memory Test	: Disabled
Memory Test Tick Sound	: Enabled
Hit Message Display	: Enabled
Hard Disk Type 47 RAM Area	: 0:300
Wait For <F1> If Any Error	: Enabled
System Boot Up Num Lock	: On
Floppy Drive Seek At Boot	: Disabled
System Boot Up Sequence	: A, C:
External Cache Memory	: Enabled
Internal Cache Memory	: Enabled
Password Checking Option	: Setup
BootSector Virus Protection	: Disabled
CPU Internal Clock Mode	: 1X
IDE Block Mode Transfer	: Disabled

ESC: Exit	← → :Sel (CTRL) PU/PD: modify	F1: Help F2/F3: Color
F5: Old Values	F6: BIOS Setup Defaults	F7: Power-on Defaults

Figure 5-3 Advanced CMOS Setup Screen

5-3 Choosing the "ADVANCED CHIPSET SETUP" option from the INITIAL SETUP SCREEN menu, the following screen is displayed. This sample screen contains the manufacturer's default values for the motherboard.

**ADVANCED
CHIPSET
SETUP**

AMIBIOS SETUP PROGRAM - ADVANCED CHIPSET SETUP (C) 1993American Megatrends, Inc., All Rights Reserved			
AUTO Config Function	: Enabled	F Segment Shadow RAM	: Into-486
Cache Read Option	: 3-2-2-2	E Segment Shadow RAM	: Disabled
Cache write Option	: 2 W.S.	C000-C3FF Shadow RAM	: Into-486
DRAM Type	: PageMode	C400-C7FF Shadow RAM	: Into-486
DRAM Wait State(s)	: 2 W.S.	C800-CBFF Shadow RAM	: Disabled
Keyboard Clock Select	: 9.5 MHz	CC00-CFFF Shadow RAM	: Disabled
AT Clock Select	: CPUCLK/6	D000-D3FF Shadow RAM	: Disabled
IO Recovery Time	: 9/3 BCLK	D400-D7FF Shadow RAM	: Disabled
Hold PD Bus	: 2~3 T	D800-DBFF Shadow RAM	: Disabled
Refresh Cycle	: Slow	DC00-DFFF Shadow RAM	: Disabled
Check ELBA# Signal	: in T2	Refresh Divider	: 1
Non-Cacheable Block1 Enable	: Disabled		
Non-Cacheable Block-1 Size	: 4MB		
Non-Cacheable Block-1 Base	: 0KB		
Non-Cacheable Block2 Enable	: Disabled		
Non-Cacheable Block-2 Size	: 16MB		
Non-Cacheable Block-2 Base	: 0KB		
Memory Remapping	: Enabled		
ESC: Exit ↓→↑←:Sel (CTRL) PU/PD: Modify F1: Help F2/F3: Color F5: Old Values F6: BIOS Setup Defaults F7: Power-on Defaults			

Figure 5-4 Advanced Chipset Setup Screen

**5-4
AUTO
CONFIGURATION WITH
BIOS
DEFAULTS**

"AUTO CONFIGURATION WITH BIOS DEFAULTS" loads the default system values directly from ROM. If the stored record created by the Setup program becomes corrupted (and therefore unusable), these defaults will load automatically when you turn the computer on.

AMIBIOS SETUP PROGRAM - AMI BIOS SETUP UTILITIES
(C) 1990 American Megatrends Inc., All Rights Reserved

STANDARD CMOS SETUP
ADVANCED CMOS SETUP
ADVANCED CHIPSET SETUP
AUTO CONFIGURATION WITH BIOS DEFAULTS
AUTO CONFIGURATION WITH POWER-ON DEFAULTS

Load BIOS Setup Default Values from ROM Table (Y/N) ? N

Load BIOS Setup Default Values for Advanced CMOS and Advanced CHIPSET Setup

ESC: Exit ↓ → ← :Sel F2/F3: Color F10: Save & Exit

Figure 5-5 Auto Configuration with BIOS Defaults Screen

5-5 AUTO CONFIGURATION WITH POWER-ON DEFAULTS

The "AUTO CONFIGURATION WITH POWER-ON DEFAULTS" loads the settings detected when you turn on the computer. If your system is behaving erratically you can use this feature to check for incorrect settings.

AMIBIOS SETUP PROGRAM - BIOS SETUP UTILITIES
(C) 1990 American Megatrends Inc., All Rights Reserved

STANDARD CMOS SETUP
ADVANCED CMOS SETUP
ADVANCED CHIPSET SETUP
AUTO CONFIGURATION WITH BIOS DEFAULTS
AUTO CONFIGURATION WITH POWER-ON DEFAULTS

Load Power-On Default Values from ROM Table (Y/N) ? N

Load Power-On Default Values for Advanced CMOS and Advanced CHIPSET Setup

ESC: Exit ↓ → ↑ ← :Sel F2/F3: Color F10: Save & Exit

Figure 5-6 Auto Configuration with Power-On Defaults

5-6 CHANGE PASSWORD

To change the password, choose the **"CHANGE PASSWORD"** option from the Setup main menu and press [Enter].

1. If the CMOS is bad or this option has never been used, there is default password which is stored in the ROM. The screen will display the following messages:

Enter ROM Password:

Press the [Enter] key and continue to change the password.

2. If the CMOS is good or this option has been used to change the default password, the user is asked for the password stored in the CMOS. The screen will display the following message:

Enter Current Password:

Enter the correct password and continue to change the password.

3. After pressing the [Enter] key (ROM password) or current password (user-defined password), you can change the password stored in the CMOS. The password can be at most 6 characters long.

Remember, to enable this feature. You must first select the "Password Checking Option" either "Setup", or "Always" in the ADVANCED CMOS SETUP.

5-7 "AUTO DETECT HARD DISK" This utility can
AUTO DETECT IDE HARD DISK TYPE, when you
DETECT unknown the HARD DISK TYPE. You can use this utility,
HARD DISK to help you self-detect correct HARD DISK TYPE.

AMIBIOS SETUP PROGRAM - AUTO DETECT HARD DISK
(C) 1992 American Megatrends Inc., All Rights Reserved

	Cyl	Head	WP	com	L	Zone	Sect	Size (MB)
Hard Disk C: Type : 47=USER TYPE	776	8	65535	776	33	100		

Accept Parameters for C: (Y/N) ? Y

ESC: Exit

Figure 5-7 AUTO DETECT HARD DISK SCREEN

**5-8
WRITE TO
CMOS AND
EXIT**

"WRITE TO CMOS AND EXIT". If you select this and press the [enter] key the values entered in the setup utilities will be recorded in the CMOS memory of the chip set. The microprocessor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

**5-9
DO NOT
WRITE TO
CMOS AND
EXIT**

"DO NOT WRITE TO CMOS AND EXIT" Selecting this option and pressing the [Enter] key lets you exit the Setup program without recording any new values or changing old ones.

APPENDIX
Hard Disk
Types
Reference
Table

TYPE	CYLINDERS	WRITE-HEADS	LANDING-PRECOMP	CAPACITY-ZONE	SECTOR	(MBYTES)
1	306	4	128	305	17	10
2	615	4	300	615	17	20
3	615	6	300	615	17	31
4	940	8	512	940	17	62
5	940	6	512	940	17	47
6	615	4	65535	615	17	20
7	462	8	256	511	17	31
8	733	5	65535	733	17	30
9	900	15	65535	901	17	112
10	820	3	65535	820	17	20
11	855	5	65535	855	17	35
12	855	7	65535	855	17	50
13	306	8	128	319	17	20
14	733	7	65535	733	17	43
15	000	0	000	000	0	00
16	612	4	0000	663	17	20
17	977	5	300	977	17	41
18	977	7	65535	977	17	57
19	1024	7	512	1023	17	60
20	733	5	300	732	17	30
21	733	7	300	732	17	43
22	733	5	300	733	17	30
23	981	10	65535	981	17	81
24	925	7	0000	925	17	54
25	925	9	65535	925	17	69
26	754	7	754	754	17	44
27	754	11	65535	754	17	69
28	699	7	256	699	17	41
29	823	10	65535	823	17	68
30	918	7	918	918	17	53
31	1024	11	65535	1024	17	94
32	1024	15	65535	1024	17	128
33	1024	5	1024	1024	17	43
34	816	15	65535	816	32	191
35	1024	9	65535	1024	17	77

APPENDIX
Hard Disk
Types
Reference
Table

TYPE	CYLINDERS	WRITE- HEADS	LANDING PRECOMP	CAPACITY ZONE	SECTOR (MBYTES)	
36	1024	8	512	1024	17	68
37	615	8	128	615	17	41
38	745	4	512	745	28	41
39	987	7	987	987	17	57
40	820	6	820	820	17	41
41	977	5	977	977	17	41
42	981	5	981	981	17	41
43	755	16	65535	755	17	100
44	887	13	65535	887	34	191
45	968	10	65535	968	34	161
46	751	8	0	751	17	50

Note:

Type 47 is user type

DATE	TIME	LOCATION	WIND	TEMP	SEA
------	------	----------	------	------	-----

10	10	10	10	10	10
11	11	11	11	11	11
12	12	12	12	12	12
13	13	13	13	13	13
14	14	14	14	14	14
15	15	15	15	15	15
16	16	16	16	16	16
17	17	17	17	17	17
18	18	18	18	18	18
19	19	19	19	19	19
20	20	20	20	20	20
21	21	21	21	21	21
22	22	22	22	22	22
23	23	23	23	23	23
24	24	24	24	24	24
25	25	25	25	25	25
26	26	26	26	26	26
27	27	27	27	27	27
28	28	28	28	28	28
29	29	29	29	29	29
30	30	30	30	30	30

1000